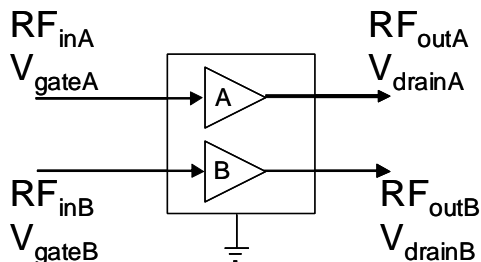


Low Band Dual LNA (700-915 MHz)

Functional Block Diagram



Ground and source connections may be through the paddle or package pins

Features

- 0.32 dB Noise Figure
- 20.7 dB Gain
- 12.5 dBm IIP3
- 20 dBm P1dB
- 4 x 4 mm package
- RoHS compliant, Pb-free

Applications

- Base Station receivers
- Tower-mounted amplifiers

Package Style



16-lead QFN 4 x 4 mm

Product Description

The TriQuint TQP3M6004 is a packaged low noise dual pHEMT discrete device operating from 700 - 915 MHz. This broadband device is useful in a number of different applications, and is particularly well suited for cellular or WiMAX base station or tower-mounted amplifier products.

TQP3M6004 consists of a single monolithic GaAs die mounted in a small 4 x 4 QFN package.

This device is a discrete dual LNA device is intended to be used as a balanced pair in wireless networks applications.

Electrical Characteristics¹

Parameter	Typ	Units
Gain	20.7	dB
Saturated Output Power	20.7	dBm
Noise Figure	0.32	dB
Input IP3	12.5	dBm
Drain Current	70	mA

Note 1: Test Conditions: $V_d = 4 V$, $Freq. = 830 MHz$, $I_d = 70 mA$ per channel, $T_A = 25 ^\circ C$.



Low Band Dual LNA (700-915 MHz)

Absolute Maximum Ratings

Symbol	Parameter	Absolute Maximum Value	Units
Vd	Drain Voltage	5	V
Vg	Gate Voltage	-1.0 to +0.5	V
Id	Drain Current (per channel)	500	mA
Ig	Gate current (per channel)	5.0	mA
Pin	Input Continuous Wave Power (total)	13	dBm
PD	Power Dissipation (total)	1.1	W
Tch	Operating Channel Temperature	150	°C
TM	Mounting Temperature (10 seconds)	260	°C
TSG	Storage Temperature	-65 to 150	°C

Note: The part may not survive all maximums applied simultaneously.

Electrical Specifications¹

Parameter	Conditions	Min.	Typ	Max.	Units
Drain Voltage ³		3	4	5	V
Total Drain Current			140		mA
Frequency Range		700		915	MHz
Noise Figure ²	F = 830 MHz, Id = 70 mA each channel		0.55		dB
Noise Figure per channel	F = 830 MHz, Id = 70 mA		0.32	0.5	dB
Gain ²	F = 830 MHz		20.5		dB
Gain per channel	F = 830 MHz	20.0	20.7	24.0	dB
Reverse Isolation	F = 830 MHz		22.0		dB
Saturated Output Power	F = 830 MHz, Pin = 3 dBm		20.7		dBm
Input IP3 dual channel ²	F = 700 MHz, Id = 70 mA each channel		13		dBm
	F = 830 MHz, Id = 70 mA each channel		15.5		dBm
Input IP3 per channel	F = 700 MHz, Id = 70 mA each channel		10		dBm
	F = 830 MHz, Id = 70 mA each channel	9.0	12.5		dBm
Isolation between Gate 1 and Gate 2	F = 830 MHz		35		dB
Isolation between Drain 1 and Drain 2	F = 830 MHz		28		dB

Note 1: Test Conditions: Vd = 4 V, Freq. = 830 MHz, Id = 70 mA per channel, TA = 25 °C.

Note 2: Balanced pair, with baluns

Note 3: Vd is set based on a 12 ohm resistor in the drain path. See test diagram or schematic.

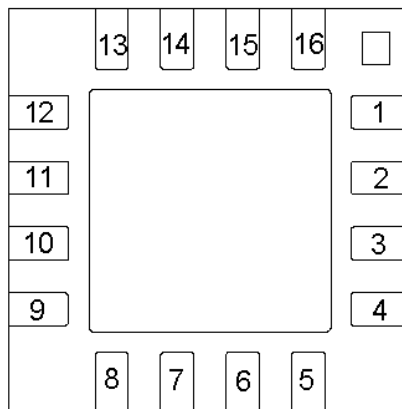
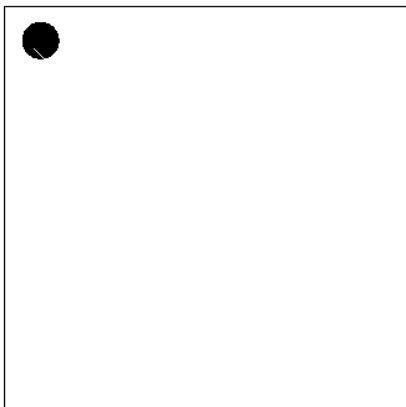
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Low Band Dual LNA (700-915 MHz)

Pin Out and Assignments

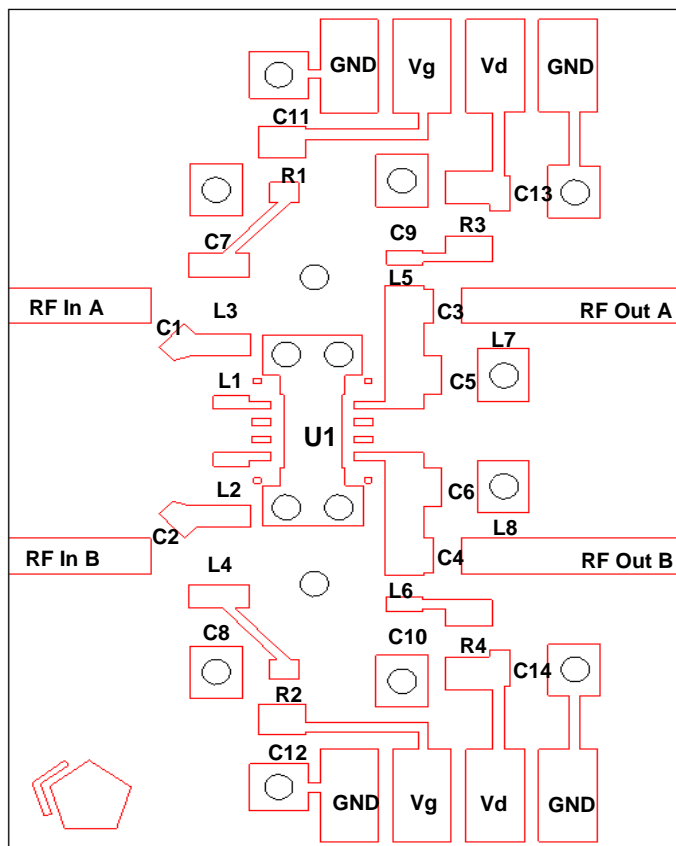


Pin	Symbol	Description
5	V _{GA}	RF Input A
8	V _{GB}	RF Input B
13	V _{DB}	RF Output B
16	V _{DA}	RF Output A
1, 2, 11, 12	N/C	No Connection
3, 4, 6, 7, 9, 10, 14, 15	GND	Connected to Ground



Low Band Dual LNA (700-915 MHz)

Typical Test Circuit



Reference Designation	Value	Quantity	Part Number
U1		1	Triquint- TQP3 M6004
C1, C2, C3, C4	10 pF	4	AVX-08052U100GAT2A
C5, C6	1.5 pF	2	AVX-08052U1R5BAT2A
C7, C8, C9, C10	27 pF	4	AVX-08052U270GAT2A
C11, C12	0.47 uF	2	PHYCOMP (YAGEO) - 222278015658
C13, C14	1 uF	2	KEMET-C0805C105K4RAC
L1, L2, L7, L8	8.2 nH	4	AVX-L08058R2DESTR
L3, L4	27 nH	2	COILCRAFT-0908SQ-27NJBL
L5, L6	22 nH	2	AVX-L0805220JESTR
R1, R2	0 Ohm	2	MULTICOMP-MC 0.063W 0603 0R
R3, R4	12 Ohms	2	PHYCOMP (YAGEO) - 232270461209

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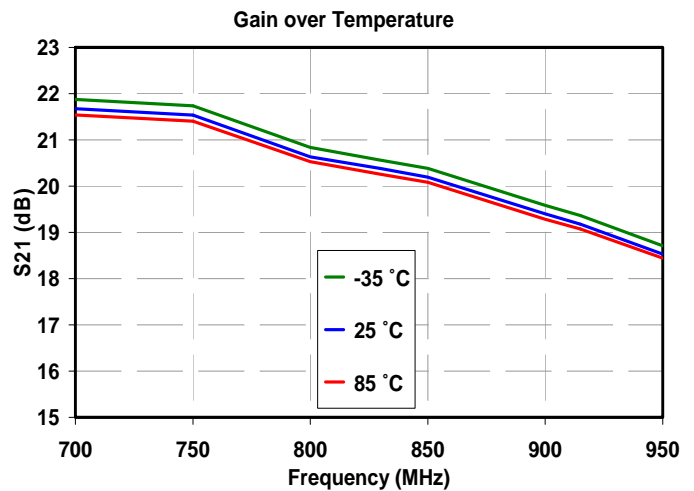
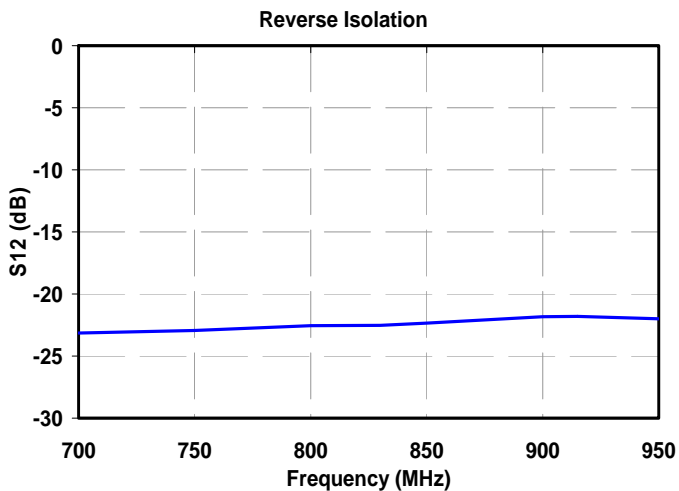
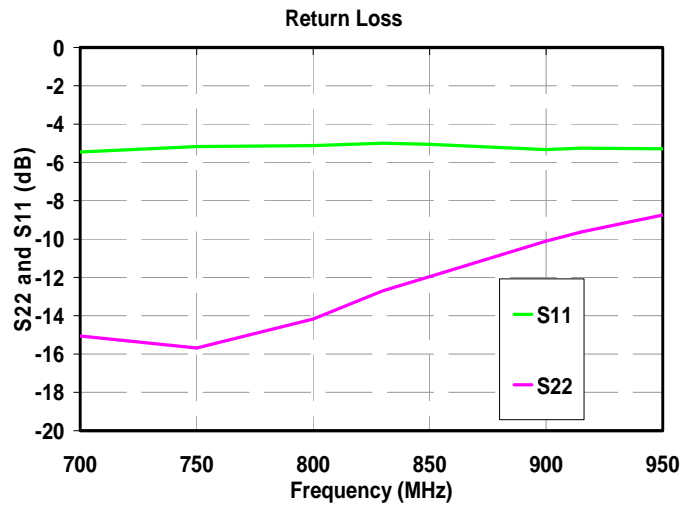
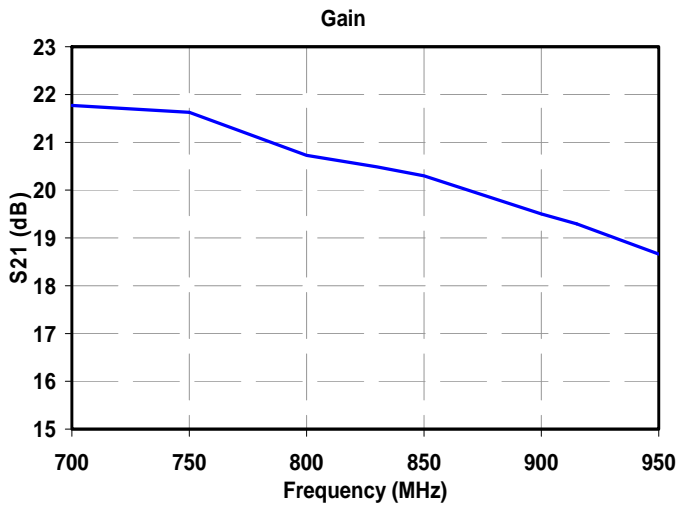
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Low Band Dual LNA (700-915 MHz)

Typical Single Channel Performance

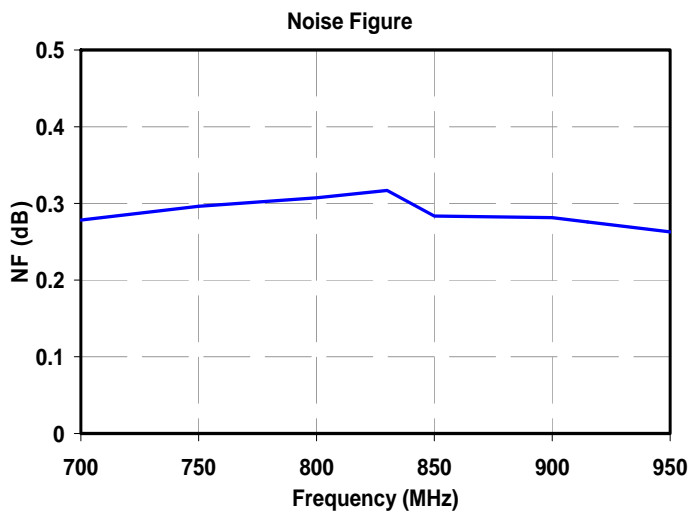
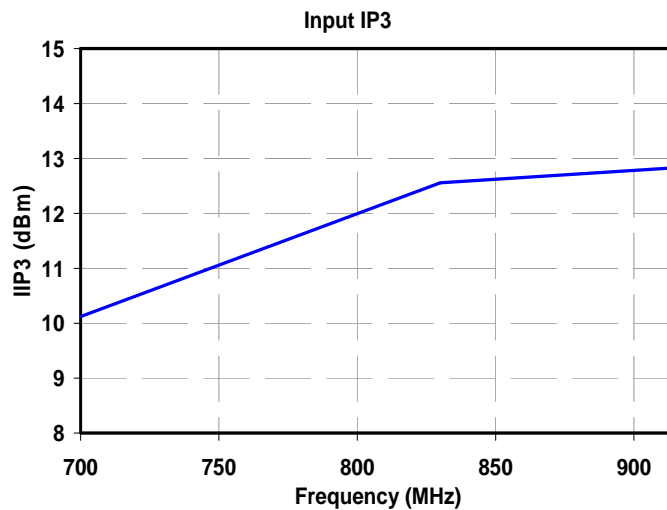
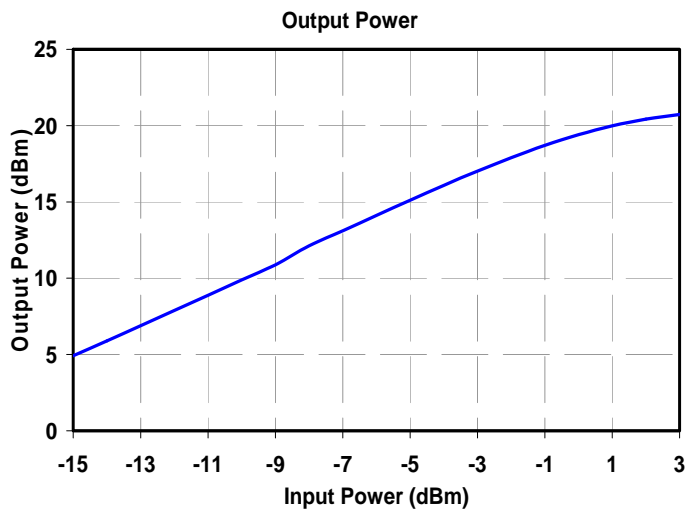
Test Conditions (Unless Otherwise Specified): $V_d = 4\text{ V}$, $Freq. = 830\text{ MHz}$, $I_d = 70\text{ mA}$, $T_A = 25\text{ }^\circ\text{C}$.



Low Band Dual LNA (700-915 MHz)

Typical Single Channel Performance

Test Conditions (Unless Otherwise Specified): $V_d = 4\text{ V}$, $Freq. = 830\text{ MHz}$, $I_d = 70\text{ mA}$, $T_A = 25\text{ }^\circ\text{C}$

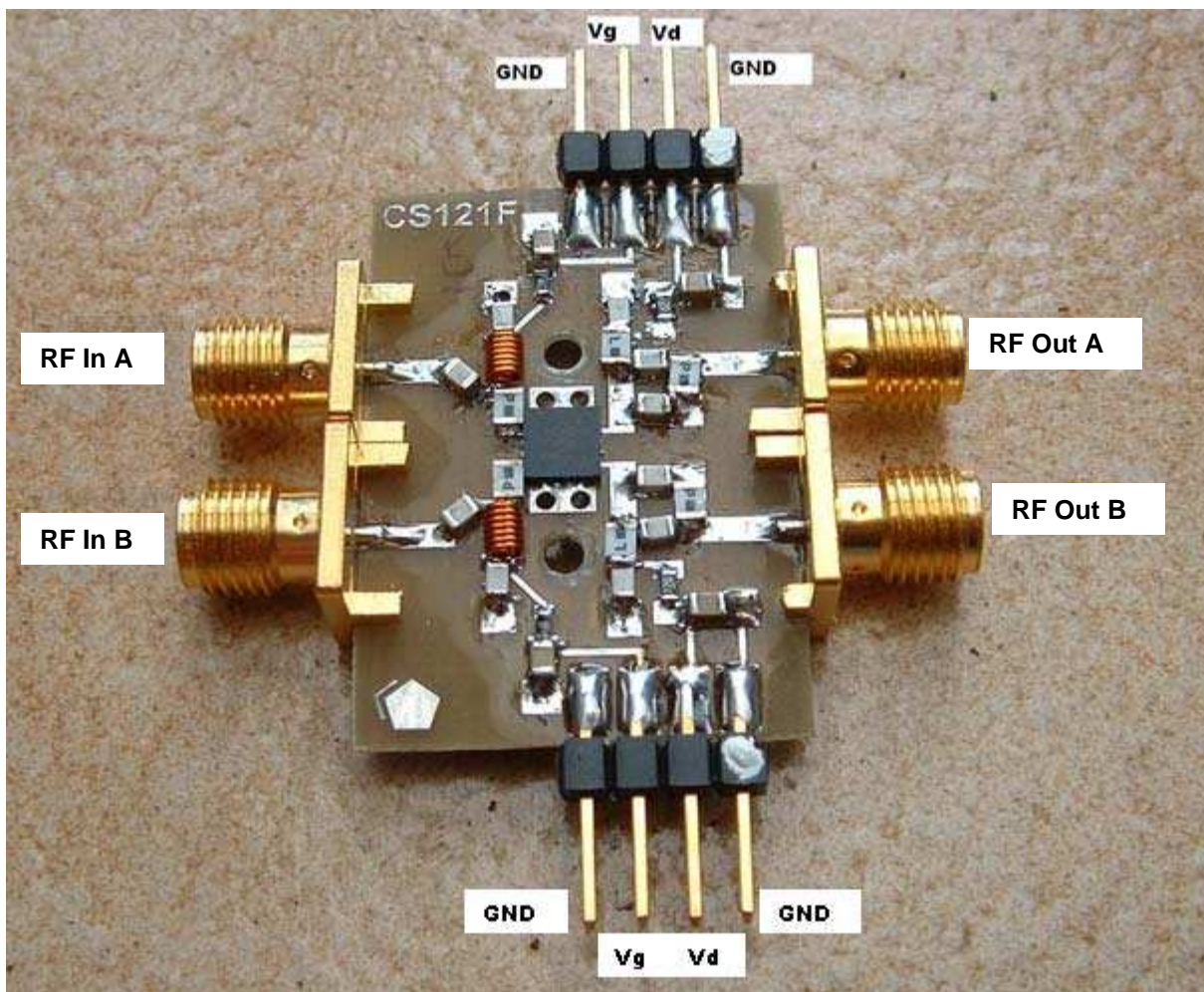


Test Board Photo

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Low Band Dual LNA (700-915 MHz)

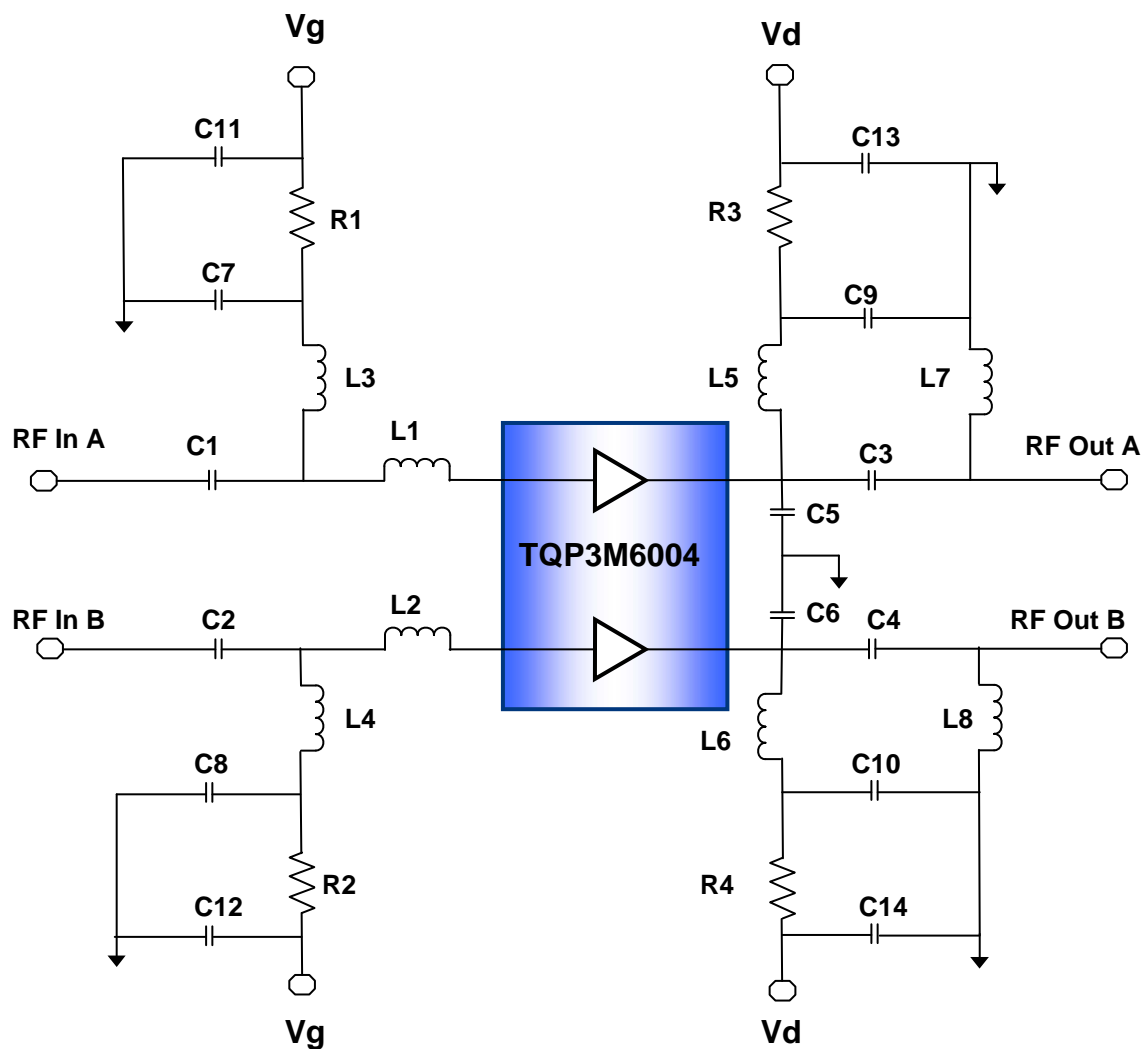


Simplified Schematic

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Low Band Dual LNA (700-915 MHz)

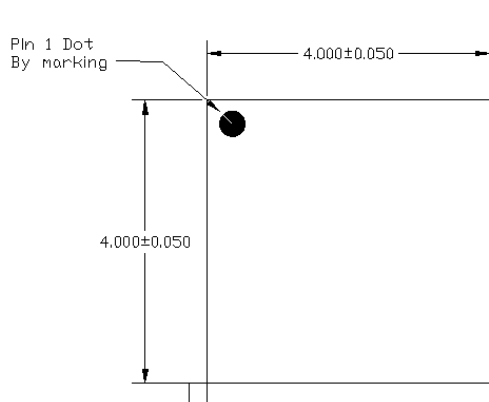


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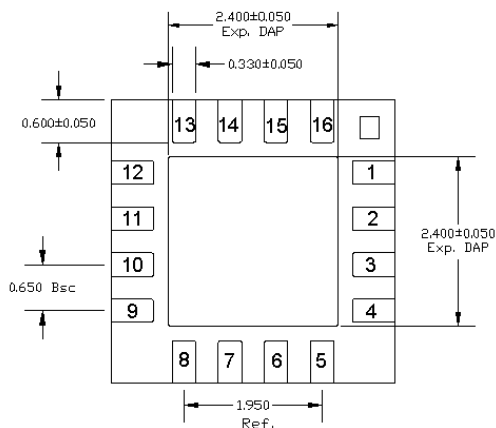


Low Band Dual LNA (700-915 MHz)

Package Type: QFN Plastic Package



TOP VIEW



BOTTOM VIEW



SIDE VIEW

All dimensions are in millimeters

Pad # 1	N/C	0.33 x 0.60	Pad # 9	GND	0.33 x 0.60
Pad # 2	N/C	0.33 x 0.60	Pad # 10	GND	0.33 x 0.60
Pad # 3	GND	0.33 x 0.60	Pad # 11	N/C	0.33 x 0.60
Pad # 4	GND	0.33 x 0.60	Pad # 12	N/C	0.33 x 0.60
Pad # 5	RF In A/ VgA	0.33 x 0.60	Pad # 13	RF Out B/ VdB	0.33 x 0.60
Pad # 6	GND	0.33 x 0.60	Pad # 14	GND	0.33 x 0.60
Pad # 7	GND	0.33 x 0.60	Pad # 15	GND	0.33 x 0.60
Pad # 8	RF In B/ VgB	0.33 x 0.60	Pad # 16	RF Out A/ VdA	0.33 x 0.60

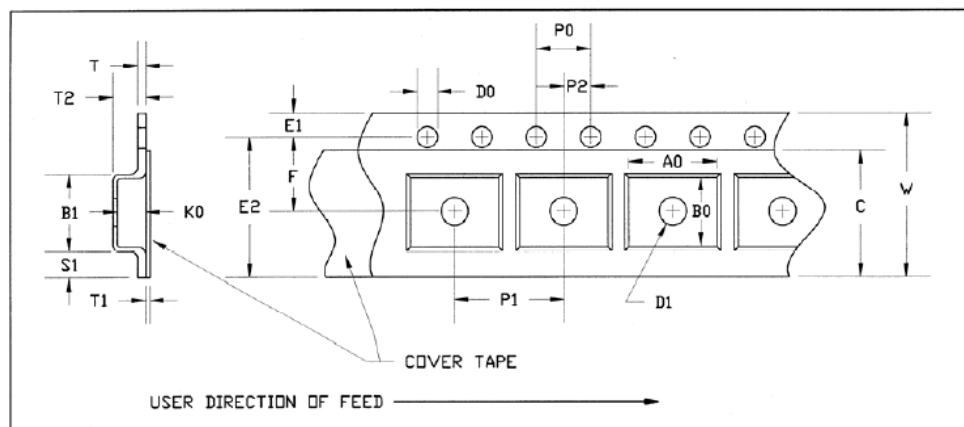
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Low Band Dual LNA (700-915 MHz)

Tape and Reel Specification



FIXED CARRIER AND COVER TAPE DIMENSIONS

PART	FEATURE	SYMBOL	SIZE (in)	SIZE (mm)
CAVITY	BOTTOM HOLE DIAMETER	D1	0.059	1.50
PERFORATION	DIAMETER	D0	0.059	1.50
	PITCH	P0	0.157	4.00
	POSITION	E1	0.069	1.75
CARRIER TAPE	THICKNESS	T	0.012	0.30
COVER TAPE	THICKNESS	T1	0.002	0.056

HP VFQFP-N 4x4 CARRIER AND COVER TAPE DIMENSIONS (See note 1)

PART	FEATURE	SYMBOL	SIZE (in)	SIZE (mm)
CAVITY	LENGTH	A0	0.171	4.35
	WIDTH	B0	0.171	4.35
	DEPTH	K0	0.043	1.10
	PITCH	P1	0.315	8.00
DISTANCE BETWEEN CENTERLINE	CAVITY TO PERFORATION LENGTH DIRECTION	P2	0.079	2.00
	CAVITY TO PERFORATION WIDTH DIRECTION	F	0.217	5.50
COVER TAPE	WIDTH	C	0.374	9.50
CARRIER TAPE	WIDTH	W	0.472	12.00

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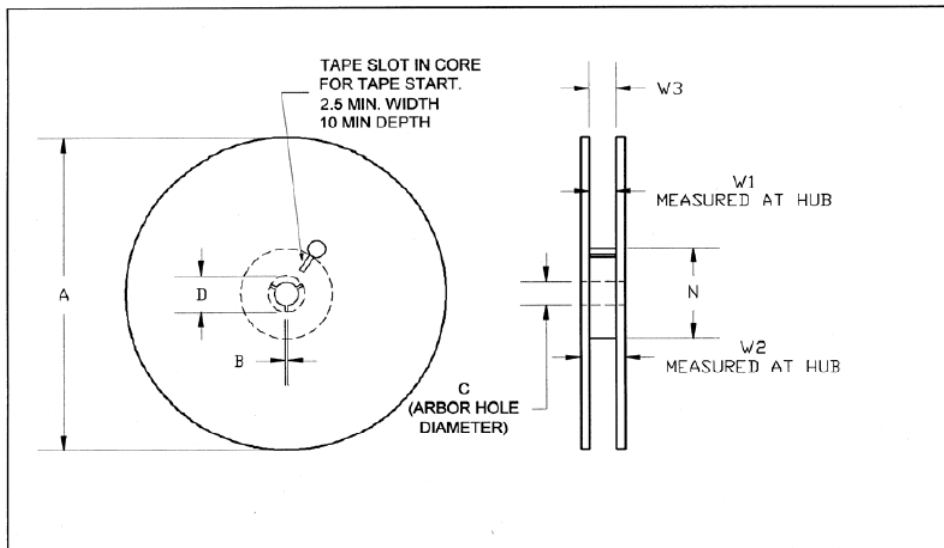
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Low Band Dual LNA (700-915 MHz)

Tape and Reel Specification

Reel Physical Dimensions



Reel Dimensions for 8mm Carrier Tape – 7” Reel

			7” Reel	
PART	FEATURE	SYMBOL	SIZE (in)	SIZE (mm)
SOT 23-6 & 8, HP VFQFP-N 2X2, 3X3, MW-6, SCT-598, SC 70-4 & 6, SLIM 7, 13 & 17, VQFN 6 3x2				
FLANGE	DIAMETER	A	6.969	177.0
	THICKNESS	W2	0.559	14.2
	SPACE BETWEEN FLANGE	W1	0.346	8.8
HUB	OUTER DIAMETER	N	4.016	102.0
	ARBOR HOLE DIAMETER	C	0.512	13.0
	KEY SLIT WIDTH	B	0.079	2.0
	KEY SLIT DIAMETER	D	0.787	20.0

Tape and Reel Quantity = 2500 pieces.



Low Band Dual LNA (700-915 MHz)

Package Marking

PIN 1



LASER MARK

Line 1 - 6004

Line 2 - XXXX = Triquint assembly lot number

Line 3 - YYWW = Year and work week

Additional Information¹

This part is compliant with RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

The part is rated Moisture Sensitivity Level 3 at 260°C per JEDEC standard IPC/JEDEC J-STD-020.

¹ For latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

Web: www.triquint.com

Tel: (503) 615-9000

Email: info_wireless@tqs.com

Fax: (503) 615-8902

For technical questions and additional information on specific applications:

Email: info_wireless@tqs.com

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